

Claims

1. A monoclonal antibody which is specifically reactive against *B. anthracis*.
2. The antibody of claim 1 which is non-reactive against *B. cereus* or *B. thuringiensis*.
- 5 3. The antibody of claim 1 which is an IgA, IgD, IgE, IgG or IgM.
4. The antibody of claim 1 which is reactive against a surface protein of *B. anthracis*.
5. The antibody of claim 4 wherein the surface protein is an EA1 protein.
6. The antibody of claim 1 which binds to SEQ ID NO. 1.
- 10 7. The antibody of claim 1 which is specifically reactive against *B. anthracis* spores.
8. The antibody of claim 1 which is specifically reactive against *B. anthracis* vegetative cells.
9. A hybridoma that produces the antibody of claim 1.
- 15 10. The hybridoma of claim 9 which is derived from an animal selected from the group consisting of cattle, chickens, goats, guinea pigs, horses, mice, pigs, primates, rabbits, rats and sheep.
11. A hybridoma deposited with ATCC and accorded accession number PTA-2632.
12. Antibody isolated from the hybridoma of claim 11.
- 20 13. An isolated antibody, or reactive portion thereof, directed to the EA1 protein of *B. anthracis*.
14. The antibody or reactive portion thereof of claim 13 which is a murine antibody; a rabbit antibody; a rat antibody; a genetically engineered antibody; a recombinant antibody; a humanized antibody; a polyclonal antibody or an affinity-purified antibody.
- 25 15. The antibody or reactive portion thereof of claim 13 which is an Fab or Fv fragment.
16. A diagnostic kit comprising an antibody that is specifically reactive against spores or vegetative cells of *B. anthracis*, *B. thuringiensis* or *B. cereus*.

17. The diagnostic kit of claim 16 which incorporates a colloidal particle based lateral flow detection system.
18. The diagnostic kit of claim 16 which incorporates a detection system selected from the group consisting of a carbon based lateral flow system; a fluorescent based assay system, a chemiluminescent system, an up converting phosphors system, a refractive indexed based detection system, a magnetic bead or latex bead system, and a micro array system.
19. A diagnostic kit comprising an antibody that is specifically reactive against spores of *B. anthracis* and not *B. thuringiensis*, and incorporates a colloidal particle based lateral flow detection system.
20. A diagnostic kit comprising an antibody that is specifically reactive against spores of *B. thuringiensis* and not *B. anthracis*, and incorporates a colloidal particle based lateral flow detection system.
21. A method for producing a species-specific monoclonal antibody to one species of *Bacillus* comprising:
 - immunizing a host with a preparation of said one species of *Bacillus*;
 - boosting said host with another preparation of an antigenically similar, but not identical, species of *Bacillus*;
 - boosting said host with said preparation of said one species;
 - fusing antibody-producing cells from the host with immortalized cells; and
 - selecting a hybridoma that produces the species-specific monoclonal antibody to said one species of *Bacillus*.
22. The method of claim 21 wherein the one species of *Bacillus* is *B. cereus*, *B. thuringiensis* or *B. anthracis*.
23. The method of claim 21 wherein the other antigenically similar species of *Bacillus* is *B. cereus*, *B. thuringiensis*, *B. anthracis* or combinations thereof.
24. The method of claim 21 wherein the one species of *Bacillus* is *B. anthracis* and the other antigenically similar species of *Bacillus* is *B. cereus* or *B. thuringiensis*.

25. The method of claim 21 wherein the one species of *Bacillus* is *B. thuringiensis* and the other antigenically similar species of *Bacillus* is *B. cereus* or *B. anthracis*.

26. The method of claim 21 wherein the preparation of said one species comprises spores, vegetative cells or combinations thereof.

5 27. The method of claim 21 wherein the preparation of said other antigenically similar species comprises spores, vegetative cells or combinations thereof.

28. The method of claim 21 wherein the species-specific monoclonal antibody is selected from the group consisting of IgA, IgE, IgG, IgM and associated sub-types.

29. The method of claim 21 wherein the host is selected from the group consisting
10 of mice, rats, horses, cattle, chickens, sheep, goats, pigs and primates.

30. The method of claim 21 wherein boosting with the antigenically similar species is performed about seven days prior to fusing.

31. The method of claim 21 wherein boosting with *B. anthracis* is performed about three days prior to fusing.

15 32. A species-specific monoclonal antibody to spores of *B. anthracis* made by the method of claim 21.

33. A diagnostic kit comprising the antibody of claim 32.

34. A hybridoma that expresses the antibody of claim 32.

35. An antibody which is specifically reactive against *B. thuringiensis* and non-
20 reactive against *B. cereus* or *B. anthracis*.

36. An antibody which is specifically reactive against *B. cereus* and non-reactive against *B. anthracis* or *B. thuringiensis*.

37. An isolated or recombinant antigen, or antigenically active portions thereof, comprising an EA1 protein of the surface layer of *B. anthracis*.

25 38. A pharmaceutical composition comprising the antigen, or active portions hereof, of claim 37 and a pharmaceutically acceptable carrier.

39. A method of using the antigen, or active portions thereof, of claim 37 as the target for an immunological detection system for *B. anthracis*.

40. A vaccine against *B. anthracis* comprising a therapeutically effective amount of the antigen, or active portions thereof, of claim 37.
41. A method for vaccinating against *B. anthracis* comprising administering the therapeutically effective amount of the vaccine of claim 40 to a patient.
- 5 42. A therapeutic agent comprising antibodies to the EA1 protein.
43. A method for treating, preventing or controlling *B. anthracis* infection comprising administering an effective amount of the therapeutic agent of claim 42 to a patient.

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